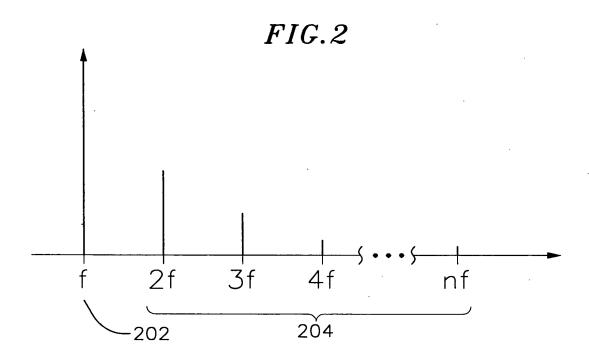
Inventors: Ward, et al Tel: 202-371-2600
Title: Applications for Differential Crystal Oscillator (as amended) MHZ 900 MHz / TV CH 14-68 470-800 MHz -102 884 MHz TELEVISION BROADCAST TV CH 7-13 / 174-216 / 104 MHz 878 MHz OVER THE AIR
BROADCAST SPECTRUM 104 -102 108 MHZ FIG. 1 TV CH 2-6 54-88 MHz MHZ FM RADIO .08 16 16 1600 88 KHz MHz AM RADIO 102-540 XHz

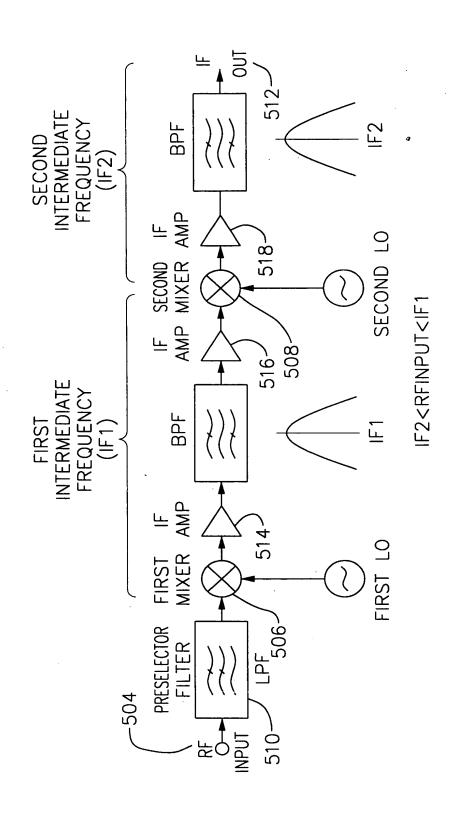
Sheet 1 of 50
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Sheet 3 of 50
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DRANO. 1875.095000I/JTH/TAD; Group Unit: To Be
Assigned
Inventors: Ward, et al Tel: 202-371-2600
Title: Applications for Differential Crystal Oscillator (as amended) KHz KHz fLO KHz KHz fRF KHz flF

FIG.4

FIG.5Dual conversion receiver



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Inventors: Ward, et al Tel: 202-371-2600

Title: Applications for Differential Crystal Oscillator (as amended)

Signal-p

Signal-n

Composite

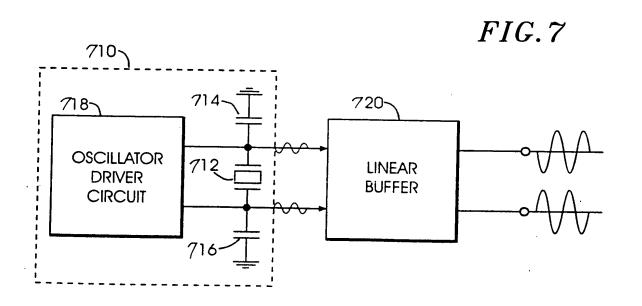


FIG.8

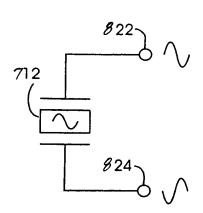


FIG.9

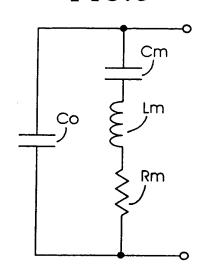


FIG. 10

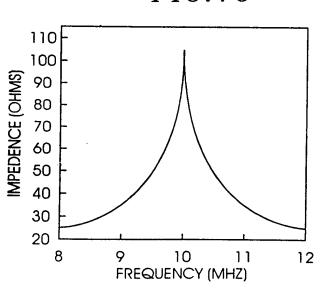
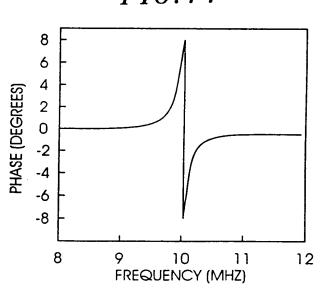


FIG. 11

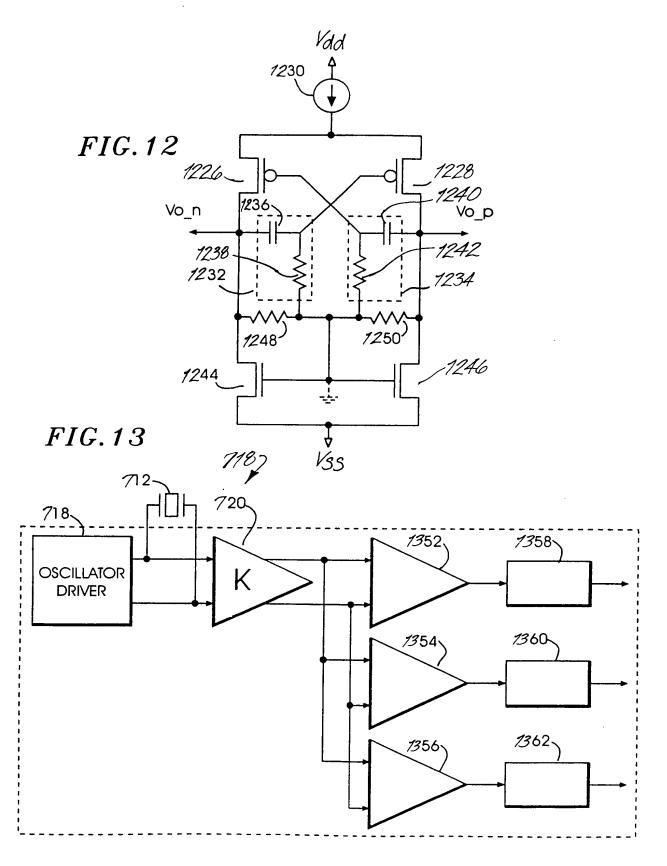


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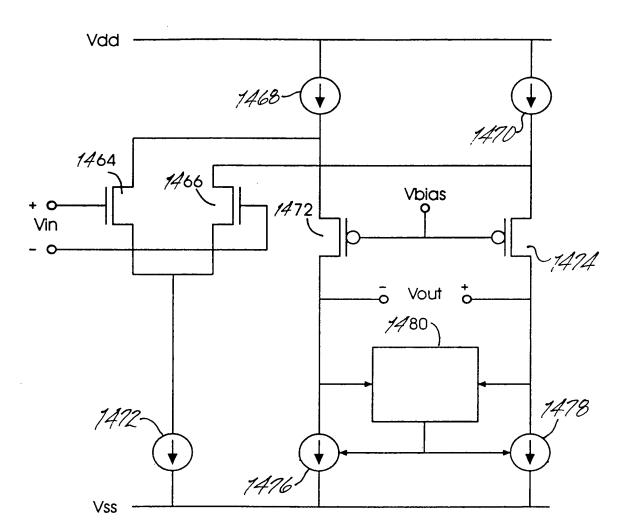
pkt No. 1875.095000I/JTH/TAD; Group Unit: To Be Assigned
Inventors: Ward, et al Tel: 202-371-2600

Title: Applications for Differential Crystal Oscillator (as
amended)



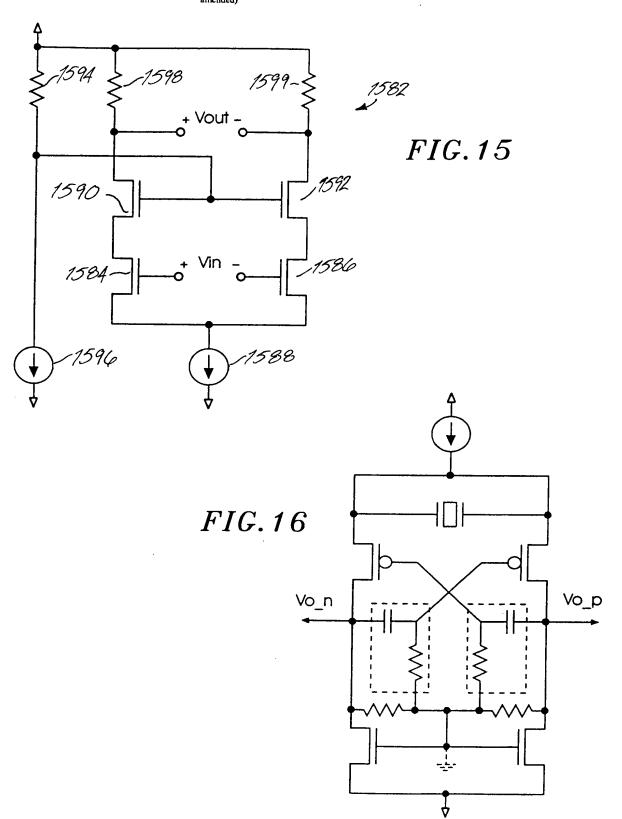
Sheet 8 of 50
Appl. No. To Be Assigned; Filed: Feb 23, 2004
Bkt No. 1875.095000I/JTH/TAD; Group Unit: To Be Assigned
Inventors: Ward, et al Tel: 202-371-2600
Title: Applications for Differential Crystal Oscillator (as
amended)

FIG. 14



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Inventors: Ward, et al Tel: 202-371-2600
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Title: Applications for Differential Crystal Oscillator (as

REFERENCE OSCILLATOR

PHASE DETECTOR

PROGRAMMABLE DIVIDER

PROGRAMMING SWITCHES

FIG. 18

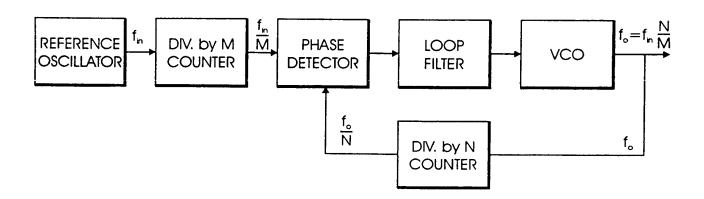
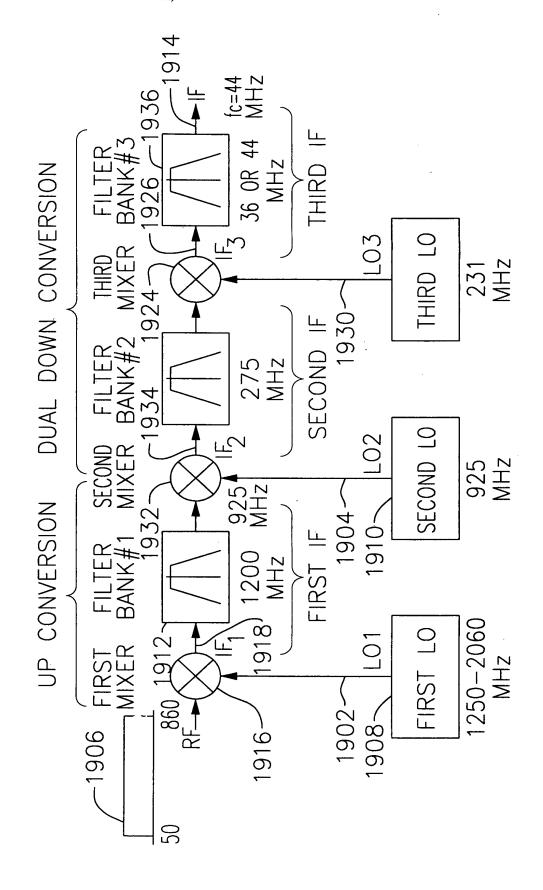
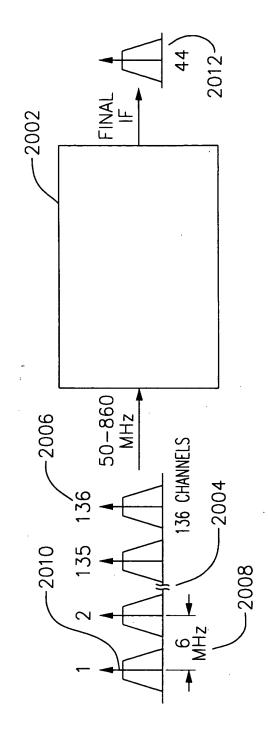


FIG. 19



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Inventors: Ward, et al Tel: 202-371-2600
Title: Applications for Differential Crystal Oscillator (as amended)



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amended)

•LO-2 REF=100KHz, SO DIVIDE RANGE=9216 TO 9280

NOTE

FIG.21

44MHz IF

PPL Xtal REFERENCE=10MHz LO-1, 10MHz FREQUENCY STEPS LO-2, 100kHz FREQUENCY STEPS

TABLE OF FREQUENCIES BASED ON COARSE/FINE PLL SOLUTION:

924.8 860 2060 1200 275.2 44.0 231 274.4 854 2050 921.6 44.0 1196 230 = = 128 1330 275.6 44.0 1202 926.4 232 923.2 274.8 122 1320 44.0 1198 231 928.0 116 1320 276.0 44.0 1204 232 924.8 110 1310 275.2 44.0 1200 231 921.6 274.4 104 1300 1196 44.0 230 1300 926.4 275.6 88 1202 44.0 232 92 923.2 1290 1198 44.0 276.0 274.8 231 86 1290 1204 928.0 44.0 232 924.8 1280 1200 80 275.6 274.4 275.2 44.0 231 921.6 74 1196 1270 44.0 230 926.4 68 44.0 1270 1202 232 62 274.8 44.0 923.2 1260 1198 230.8 44.0 928.0 276.0 1260 1204 232 56 44.0 1200 924.8 1250 231.2 275.2 50 IF-1 (MHz) LO-2(MHz) LO-1(MHz) (4HW)E-07 IF-2(MHz) IF-3(MHz) Frf (MHz)

## FIG. 22

PPL Xtol REFERENCE=10MHz LO-1, 10MHz FREQUENCY STEPS LO-2, 100kHz FREQUENCY STEPS

TABLE OF FREQUENCIES BASED ON COARSE/FINE PLL SOLUTION:

36MHz IF

NOTE • LO-2 REF=100KHz, SO DIVIDE RANGE=9280 TO 9340

20		58	66	74	85	06	86	106	114	122	130	138	146	154	=	852	SEO
														1		200	3
	1250	1260	1270	1270	1280	1290	1300	1310	1310	1320	1330	1340	1350	1350	=	2050	2060
																1	7
	1200	1202	1204	1196	1198	1200	1202	1204	1196	1198	1200	1202	1204	1106	=	1108	1200
														3		200	1200
1 C-2/MH2	021.2	0220		9	L_	3		7									
[	3.100	932.0	934.4	328.0	250	931	333	934	928.0	330	331	933	934	928.0	=	929.60	931.2
J	268.8	269.2	269.6	268.0	268.4	268.4 268.8	269.2	269.6	268.0	268.4	268.8	269.2	269.6	268.0	=	268.4	268 B
																- 50	2.00.2
	232.8	233.2	233.6	232	232	233	233	934	222	222	255	ç	$\neg \Gamma$	1000			
							3	5	37	252	3	3	457	23Z.U	:	232.4	232.8
	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	38.0	36.0	=	36.0	26.0
												?	2:33	9.0		0.00	0.00

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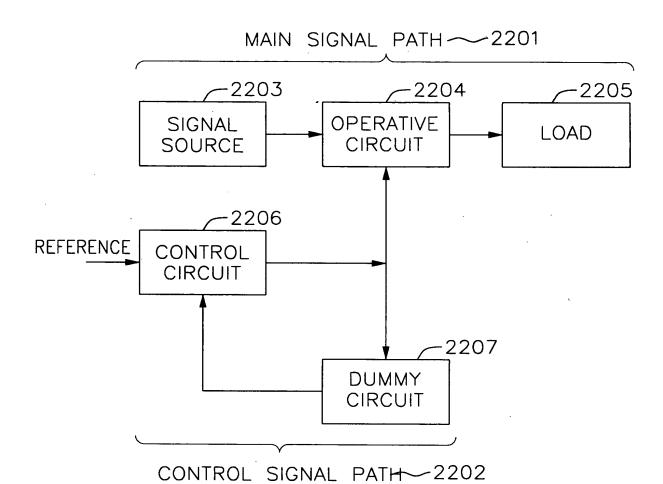
Appl. No. To Be Assigned; Filed: Feb 23, 2004

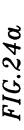
Dkt No. 1875.095000I/JTH/TAD; Group Unit: To Be Assigned Inventors: Ward, et al Tel: 202-371-2600

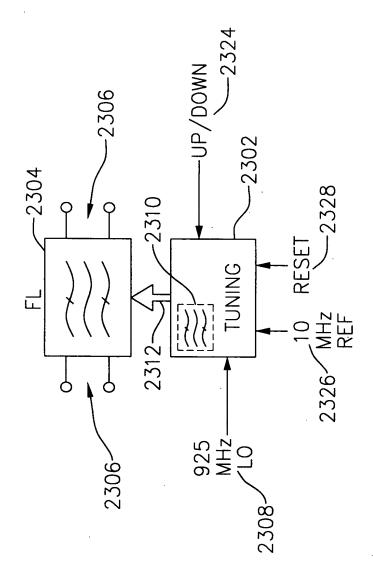
Title: Applications for Differential Crystal Oscillator (as amended)

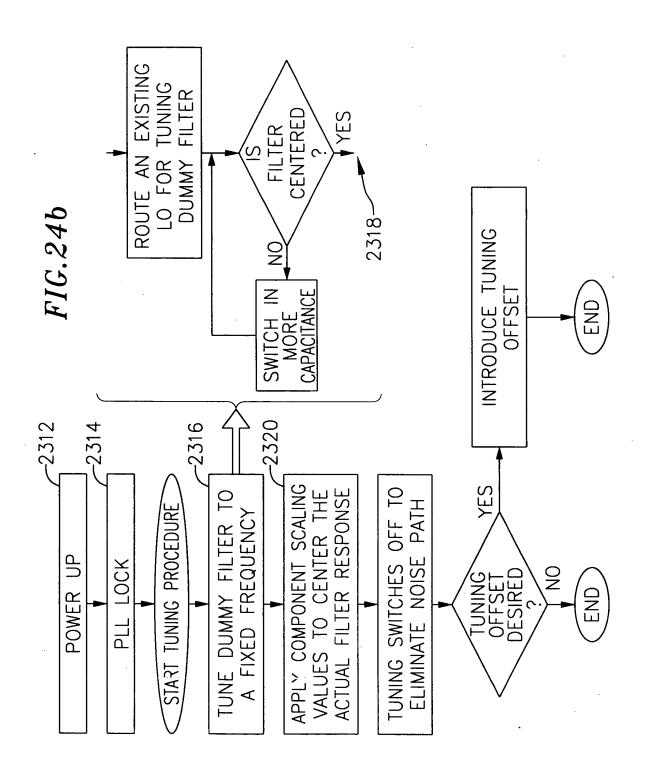
Sheet 15 of 50
Appl. No. To Be Assigned; Filed: Feb 23, 2004
Dkt No. 1875.095000I/JTH/TAD; Group Unit: To Be
Assigned
Inventors: Ward, et al Tel: 202-371-2600
Title: Applications for Differential Crystal Oscillator (as

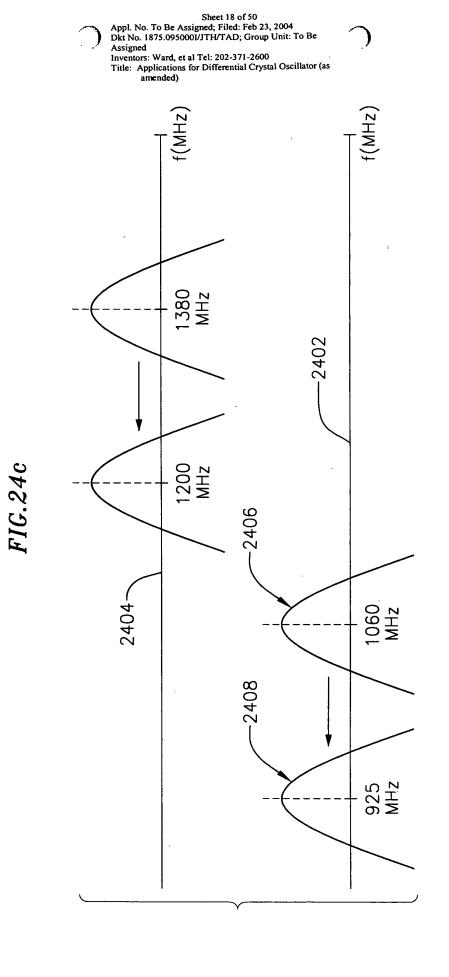
## FIG.23

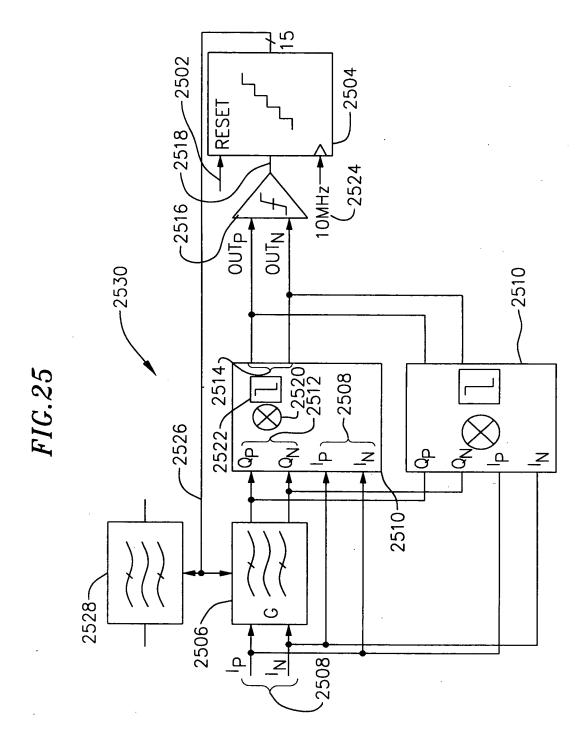








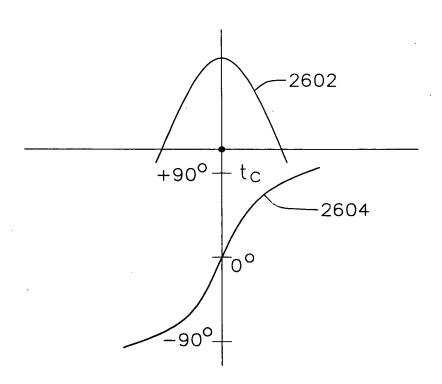




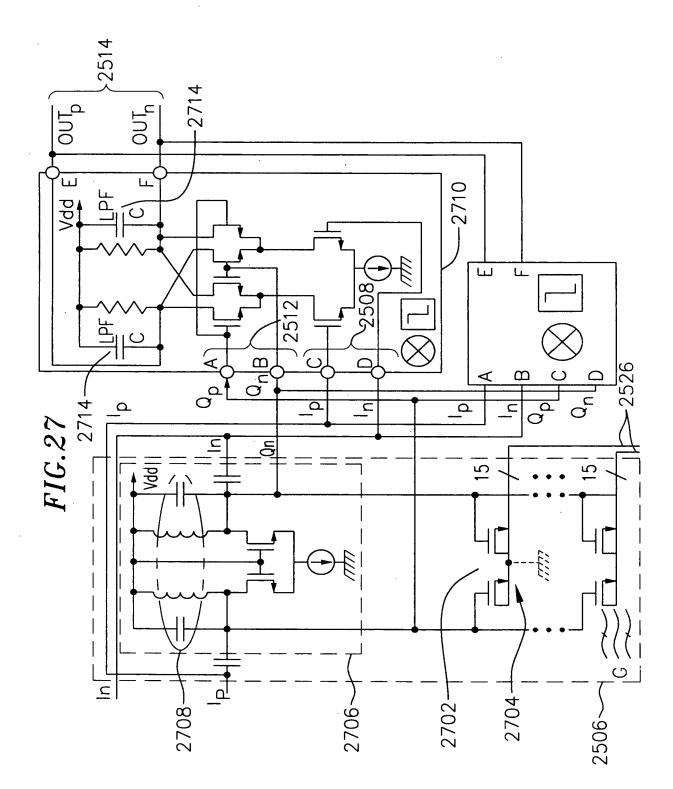
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Dkt No. 1875.095000I/JTH/TAD; Group Unit: To Be Assigned
Inventors: Ward, et al Tel: 202-371-2600
Title: Applications for Differential Crystal Oscillator (as amended)

FIG.26



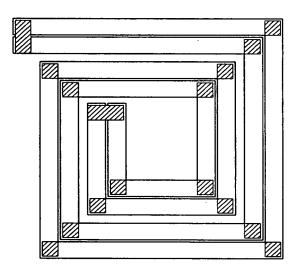
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Appl. No. To Be Assigned; Filed: Feb 23, 2004
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Inventors: Ward, et al Tel: 202-371-2600
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Inventors: Ward, et al Tel: 202-371-2600
Title: Applications for Differential Crystal Oscillator (as amended)

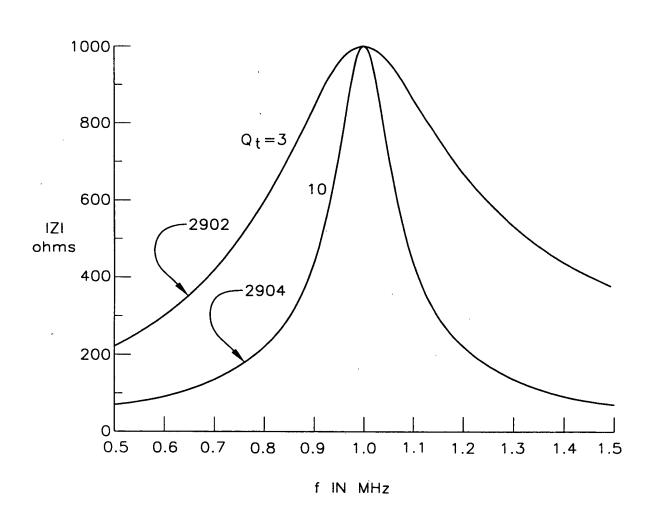
FIG.28



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Title: Applications for Differential Crystal Oscillator (as amended)

FIG.29



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Title: Applications for Differential Crystal Oscillator (as amended)

FIG.30

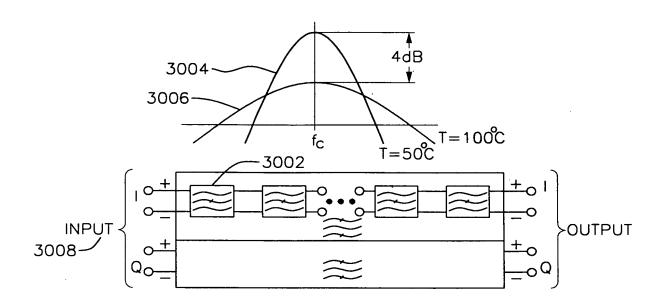
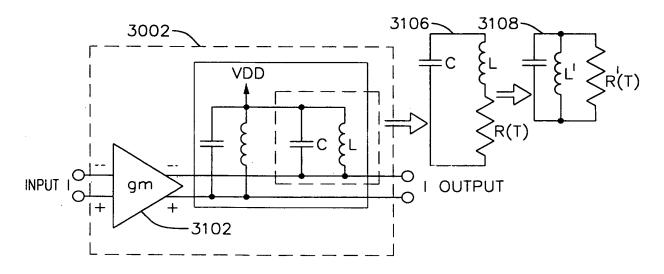
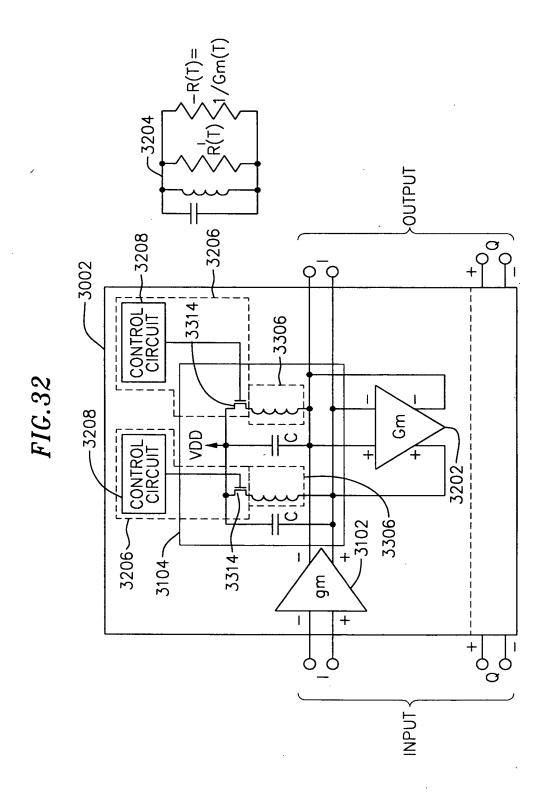
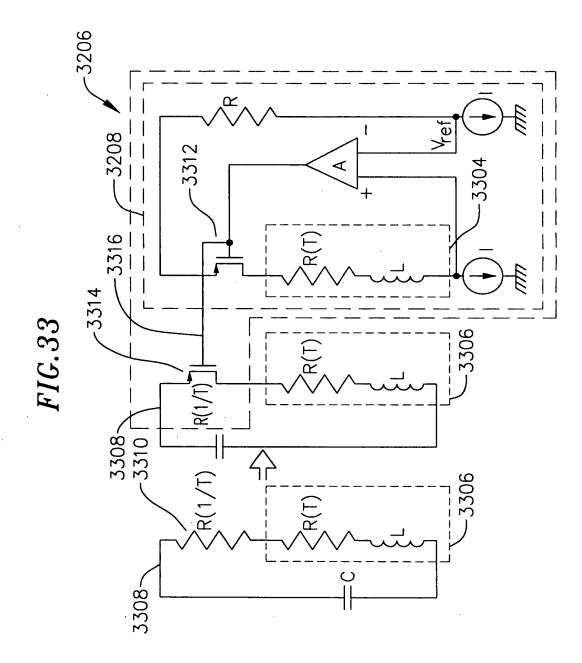


FIG.31







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Dat No. 1875.095000I/JTH/TAD; Group Unit: To Be
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Inventors: Ward, et al Tel: 202-371-2600
Title: Applications for Differential Crystal Oscillator (as amended)

FIG.34

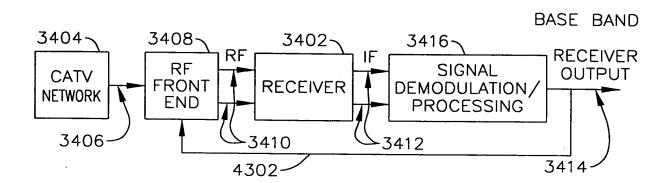
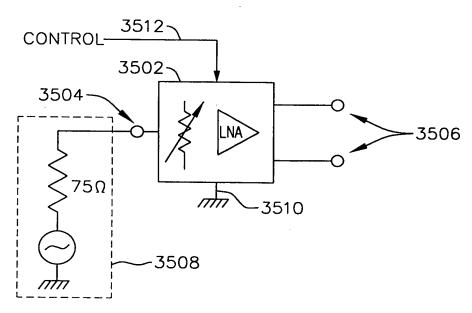
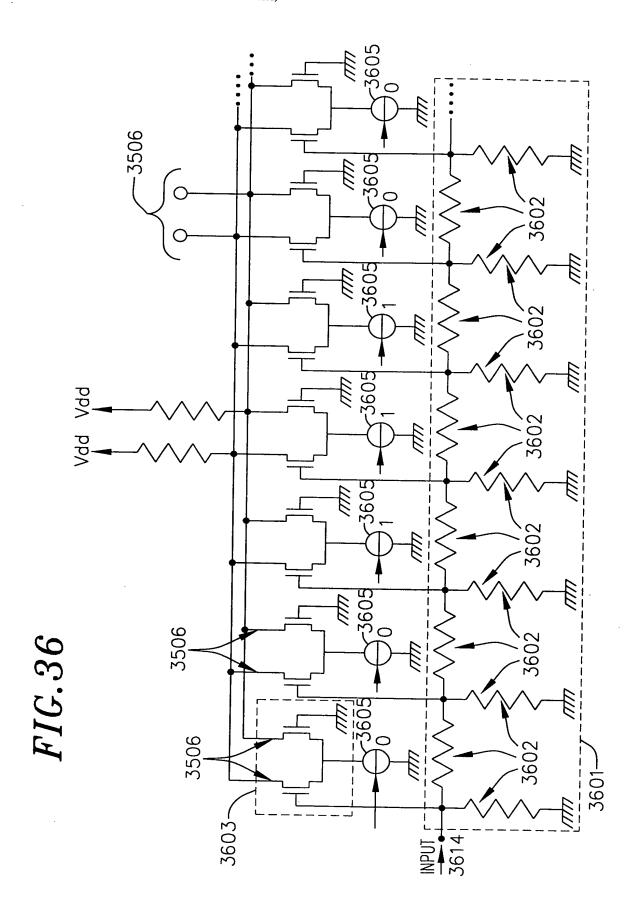
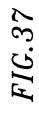
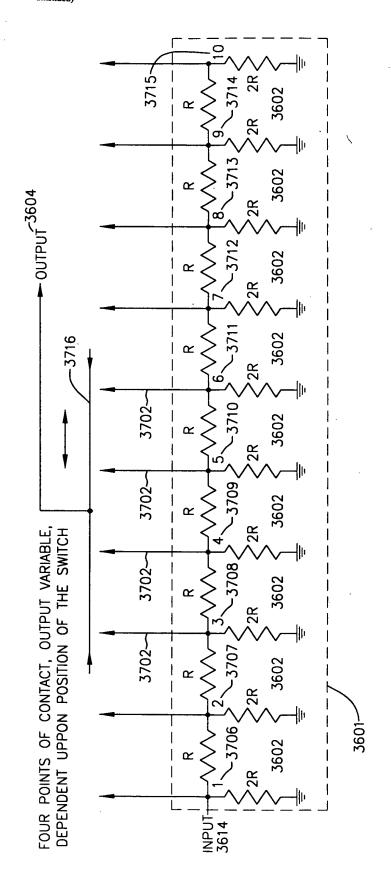


FIG.35









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Assigned
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Title: Applications for Differential Crystal Oscillator (as amended)

FIG.38

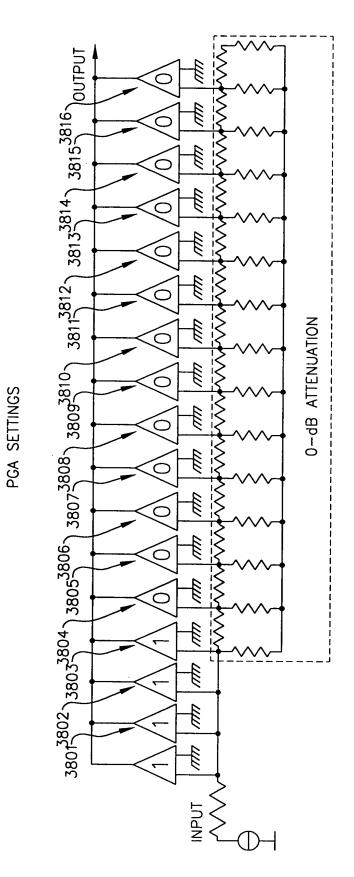
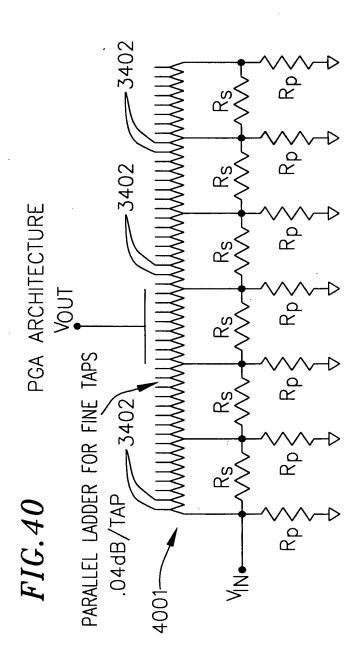


FIG.39

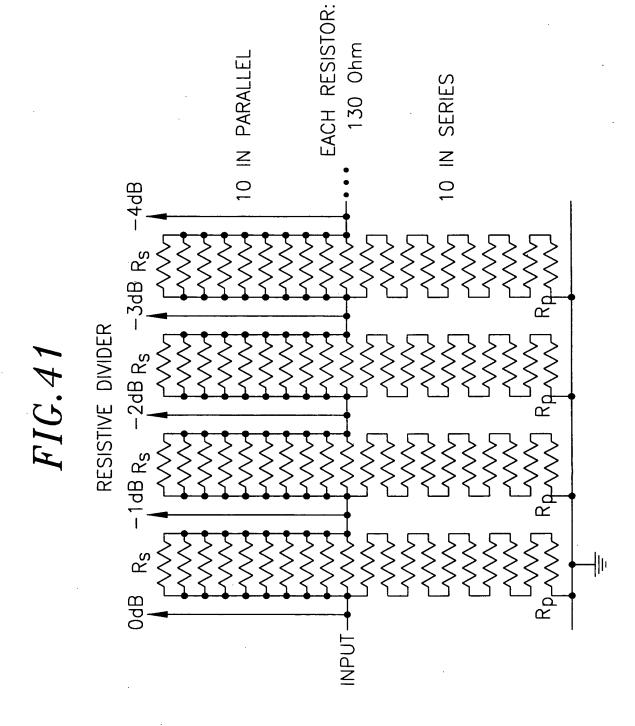


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Title: Applications for Differential Crystal Oscillator (as amended)



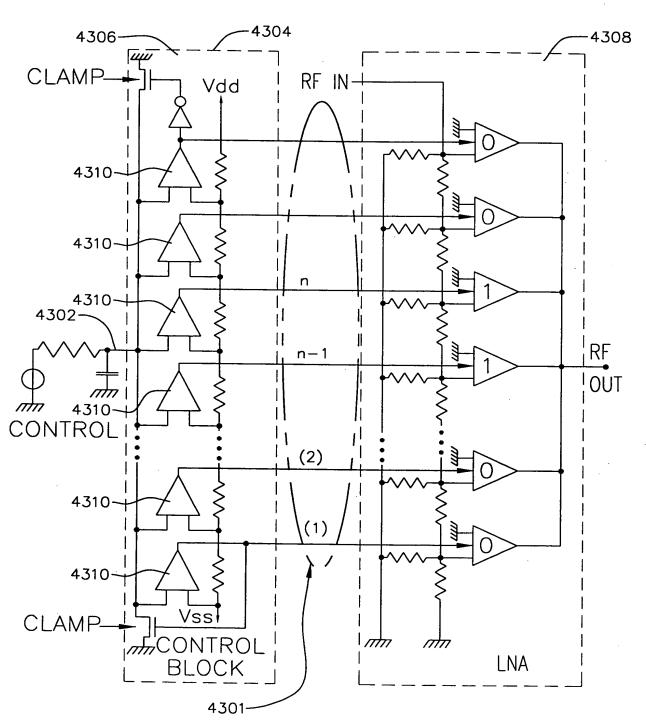
Sheet 33 of 50 Appl. No. To Be Assigned; Filed: Feb 23, 2004 Dkt No. 1875.095000I/JTH/TAD; Group Unit: To Be Assigned
Inventors: Ward, et al Tel: 202-371-2600
Title: Applications for Differential Crystal Oscillator (as CONTROL GAIN NON-MONOTONICITY 4206 4205

FIG. 42

4204

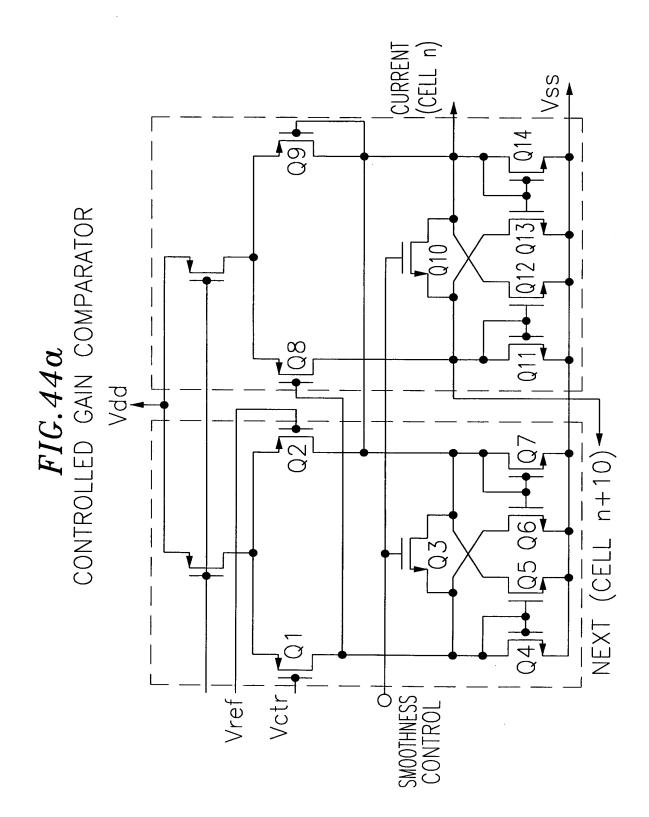
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Appl. No. To Be Assigned; Filed: Feb 23, 2004
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Title: Applications for Differential Crystal Oscillator (as amended)

FIG.43
CLAMPING CONTROL RANGE



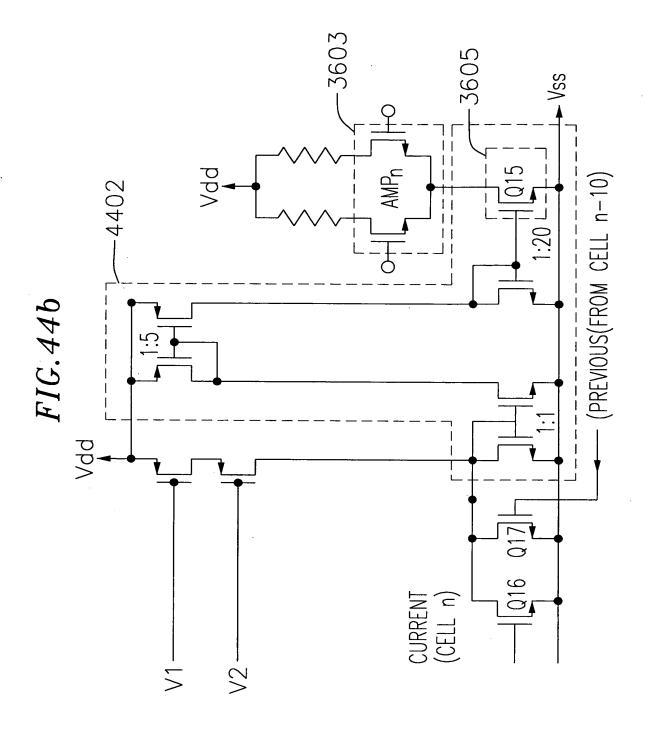
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amended)

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Dkt No. 1875.095000I/JTH/TAD; Group Unit: To Be
Assigned
Inventors: Ward, et al Tel: 202-371-2600
Title: Applications for Differential Crystal Oscillator (as



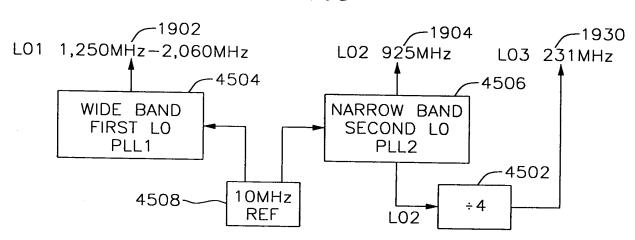
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Title: Applications for Differential Crystal Oscillator (as amended)

FIG.45

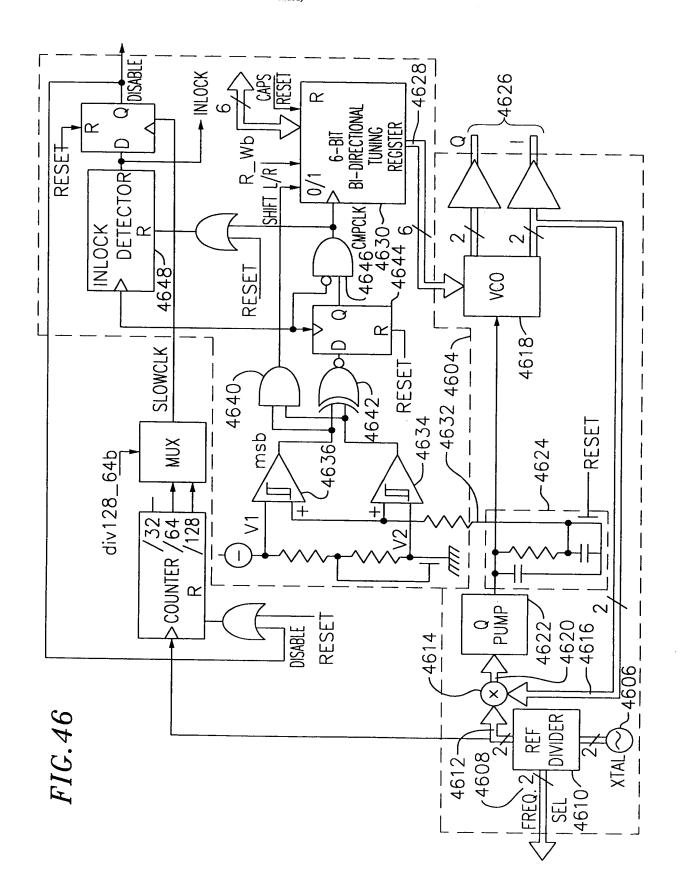


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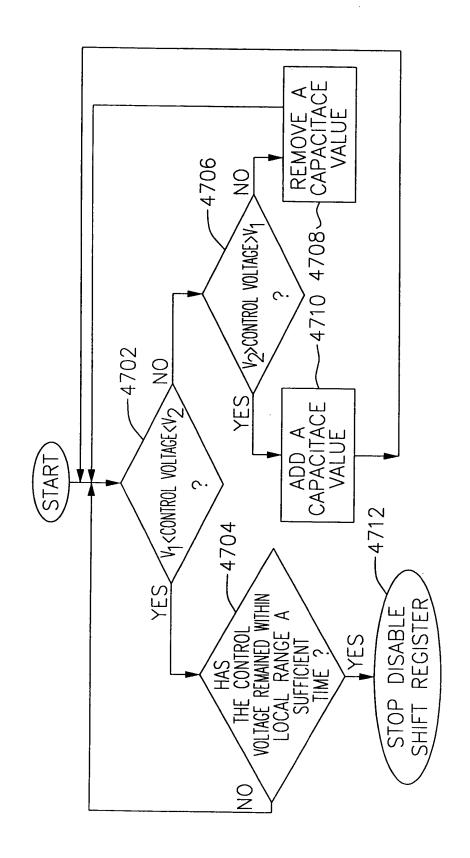
Appl. No. To Be Assigned; Filed: Feb 23, 2004

Dkt No. 1875.0950001/JTH/TAD; Group Unit: To Be Assigned Inventors: Ward, et al Tel: 202-371-2600

Title: Applications for Differential Crystal Oscillator (as

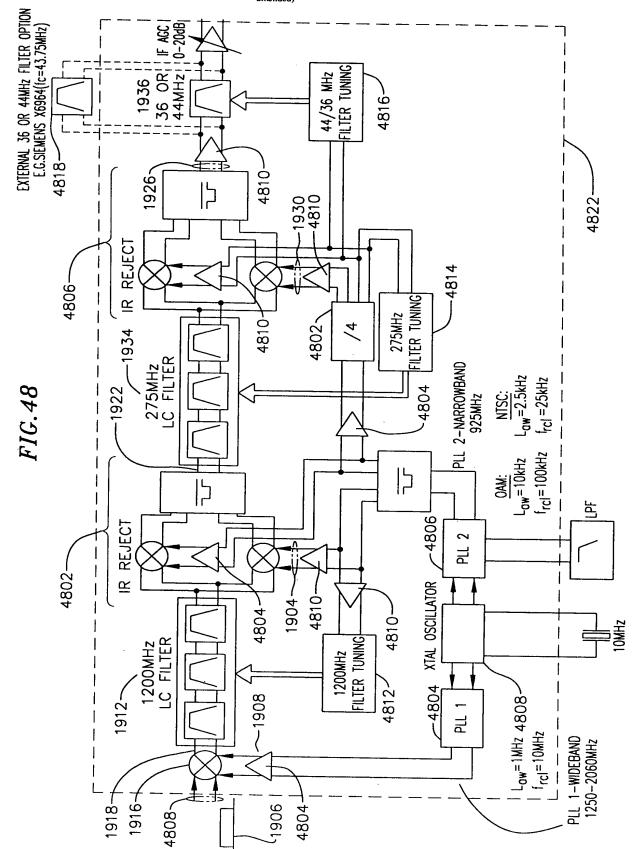


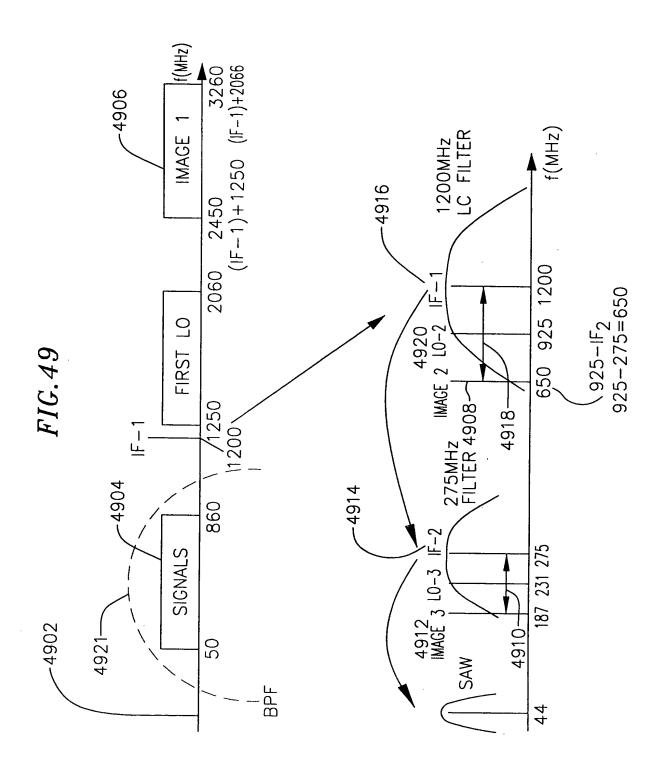
FIG. 47



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Dkt No. 1875.095000I/JTH/TAD; Group Unit: To Be Assigned Inventors: Ward, et al Tel: 202-371-2600
Title: Applications for Differential Crystal Oscillator (as amended)

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amenucu)

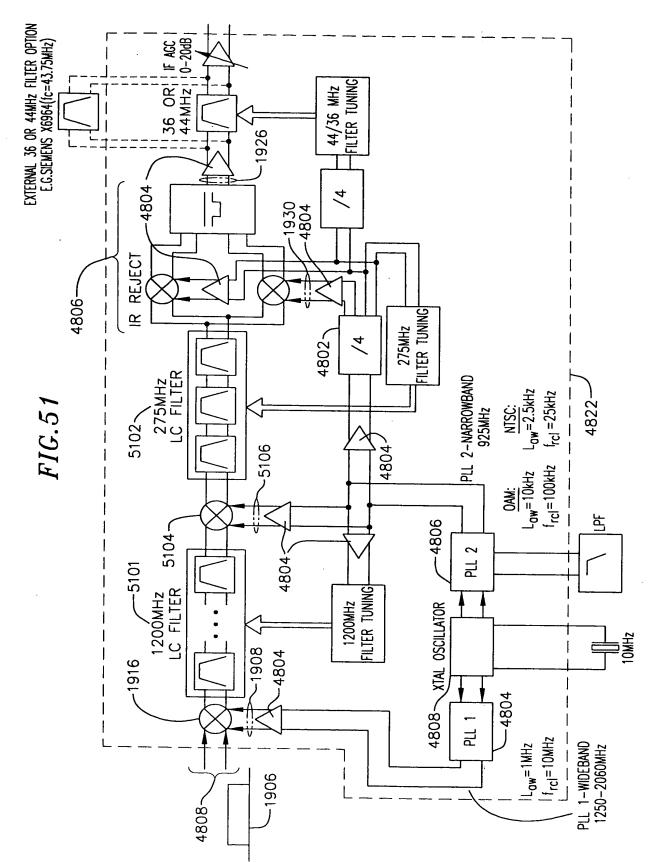
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Appl. No. To Be Assigned; Filed: Feb 23, 2004

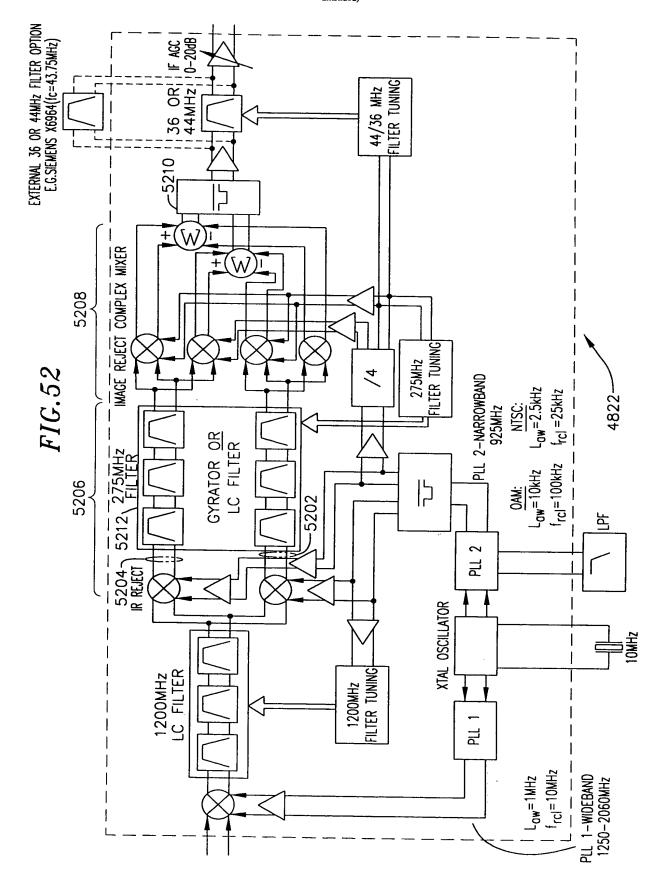
Dkt No. 1875.095000I/JTH/TAD; Group Unit: To Be Assigned

Inventors: Ward, et al Tel: 202-371-2600

Title: Applications for Differential Crystal Oscillator (as  $(f_{RF}^{-f_{LO}})$ -4522 4520 (fRF T (FRF-1017) S S -5002 FIG.50O 4514-PHASE SHIFT NETWORK 90 DEGREES DEGREES -5006 5008 90 101 4512fRF RF 4510Sheet 43 of 50
Appl. No. To Be Assigned; Filed: Feb 23, 2004
t No. 1875.095000I/JTH/TAD; Group Unit: To Be Assigned
Inventors: Ward, et al Tel: 202-371-2600
Title: Applications for Differential Crystal Oscillator (as
amended)

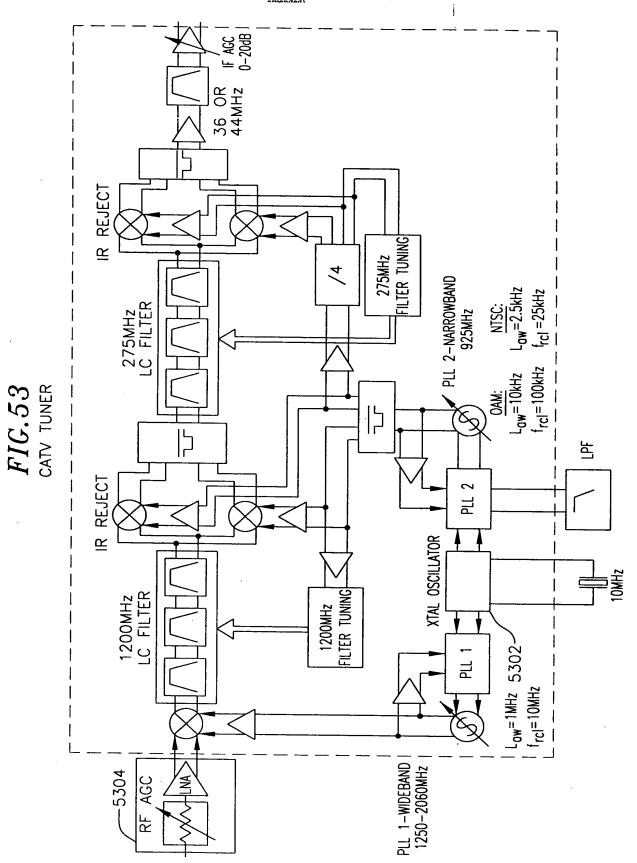


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Appl. No. To Be Assigned; Filed: Feb 23, 2004
Dkt No. 1875.095000I/JTH/TAD; Group Unit: To Be Assigned
Inventors: Ward, et al Tel: 202-371-2600
Title: Applications for Differential Crystal Oscillator (as
amended)

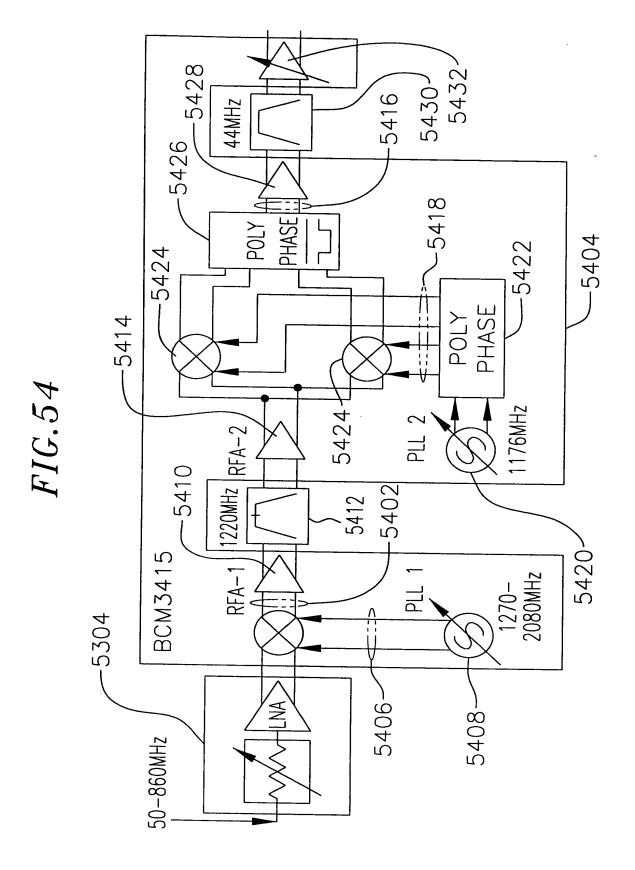


annenueu)

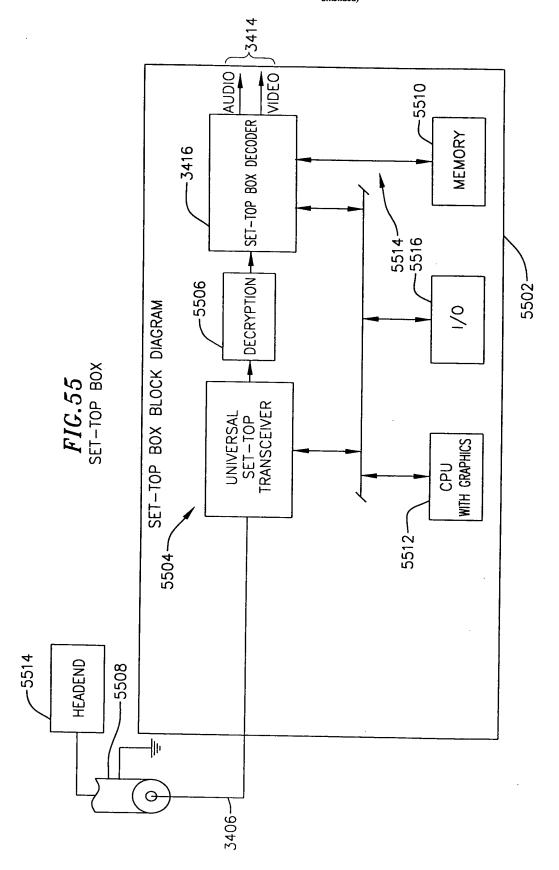
Sheet 45 of 50
Appl. No. To Be Assigned; Filed: Feb 23, 2004
Dkt No. 1875.095000I/JTH/TAD; Group Unit: To Be
Assigned
Inventors: Ward, et al Tel: 202-371-2600
Title: Applications for Differential Crystal Oscillator (as



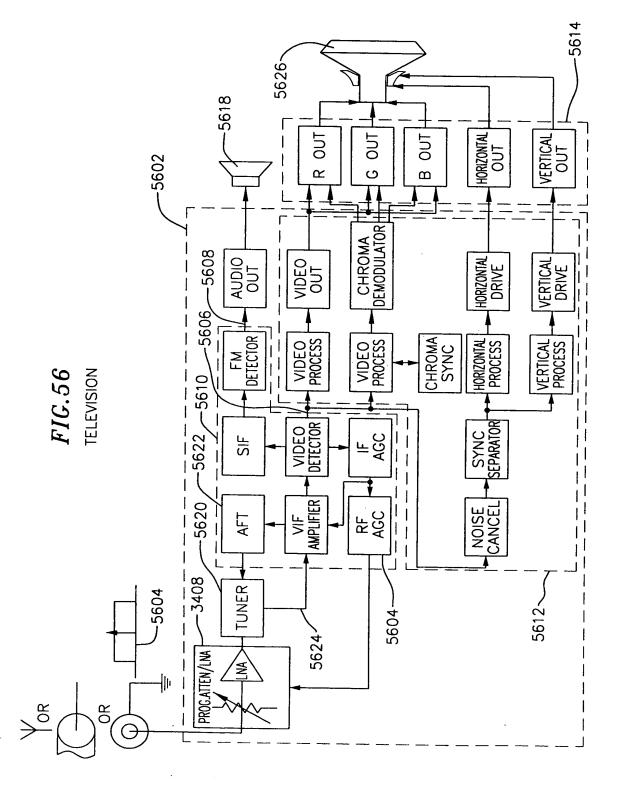
Sheet 46 of 50
Appl. No. To Be Assigned; Filed: Feb 23, 2004
t No. 1875.0950001/JTH/TAD; Group Unit: To Be Assigned
Inventors: Ward, et al Tel: 202-371-2600
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amended)



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Dkt No. 1875.095000I/JTH/TAD; Group Unit: To Be Assigned
Inventors: Ward, et al Tel: 202-371-2600
Title: Applications for Differential Crystal Oscillator (as



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Dkt No. 1875.0950001/JTH/TAD; Group Unit: To Be
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RF OUT VIDEO OUTPUT 5706 MODULATOR SIGNAL SWITCH UNIT C B RECORDING UNIT -5708 ⋖ TAPE  $\underline{Z}$ FIG.57VCR BLOCK DIAGRAM 5710-SIGNAL **PROCESSOR** PROCESSOR VIDEO SIGNAL AUDIO IN O CONTROLLER TAPE RECORDING AUDIO SYNC OR AGC DETECTOR VIDEO IN LNN ON-SCREEN DISPLAY PROCESSOR VIF AND SIF AMPLIFIERS AND DETECTORS 5708-IR RECEIVER EEPROM KEYBOARD LOCAL -5702 TUNER ASSEMBLY CONTROL TUNER BAND TIMER CPU ROM RAM -5704

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Dkt No. 1875.095000I/JTH/TAD; Group Unit: To Be Assigned Inventors: Ward, et al Tel: 202-371-2600
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